

Applicant has amended claim 1 to specify "a wheel sensing arrangement connected to said electronic control module by wiring" and has amended claim 11 to specify "said circuit and said electronic control module connected together by wiring". This amendment more clearly defines the invention and provides a solution to the unworkable nature of the invention taught by Hutchisson.

As discussed in the prior amendment, Hutchisson discloses as the primary invention a self-powered back up alarm 10 which is mounted on wheel hub 12 of a heavy truck or like vehicle. The alarm 10 includes a housing 14 mounted on the wheel hub 12. A power supply 70, an alarm circuit 72, sensors 20a, 20b and an audio alarm 22, which is a piezoelectric element, are provided in the housing 14. The sensors 20a, 20b, in combination with the alarm circuit 72, produce a reverse motion signal whenever the vehicle backs up. The audio alarm 22 is actuated by the reverse motion signal and emits an audible warning whenever the vehicle backs up.

Hutchisson teaches that the back up alarm 10 is self powered such that wiring to the remainder (including an ABS or EBS system) of the vehicle is not necessary or useful. The present invention is entirely different in that it has a wired connection to the ABS controller and is practical both technically and commercially.

Hutchisson teaches that wheel speed signals can be transmitted, presumably by radio waves, since it is a self-contained system, to a different module to comprise part of a brake control system. Practically, this would be extremely challenging for numerous reasons. To get to a point on the body of the vehicle, radio waves would have to travel through the metal wheel and axle components. Also each wheel would have to be individually identified. Even more challenging would be the issue of avoiding interference between sensors on different vehicles adjacent to each other on the highway.

Another challenge would be for radio waves to handle the required data rates – approximately one wheel speed update per 10 ms is believed to be the slowest control loop update time in use with ABS systems today. It is believed that no production ABS or EBS systems currently use radio waves to transmit wheel speed information and this is over ten (10) years later than the issue date of Hutchisson. Hutchisson's extensions, and even his teachings of the details of the main embodiment, are unconstrained by practical reality.

Therefore, to modify Hutchisson, even in view of Broome, to provide "a wheel sensing arrangement connected to said electronic control module by wiring" as specified in amended claim 1, or "said circuit and said electronic control module connected together by wiring" as specified in amended claim 11, would be against the express teachings of Hutchisson and could only be done with hindsight from a reading of the disclosure of the present invention.

Thus, Applicant submits that the combination of Hutchisson and Broome does not render obvious claims 1-15 and 33-44. Reconsideration and allowance of claims 1-15 and 33-44 is respectfully requested.

Moreover, as discussed in the prior amendment, the primary invention of Hutchisson does not relate to the braking system whatsoever. Hutchisson does disclose in Col. 7, lines 6-22 that the invention is not limited to a self-powered back up alarm. Hutchisson discloses that the hub-mounted power supply 70 can be used to power sensors other than those used to detect forward/reverse motion. In Col. 7, lines 11-22, Hutchisson discloses that:

Alarm circuit 72 can, for example, be replaced with sensors and associated circuitry designed to monitor both speed and direction of wheel rotation. Signals produced by this circuit could then be forwarded to a central processing unit in the vehicle by a low-powered transmitter also located in housing enclosure 34 and activated by power supply 70. By providing all four wheels of a vehicle with this type of speed monitoring and reporting system, a

processor would have essentially instantaneous speed information for each wheel that it could then use to control steering and/or braking.

As Hutchisson states in this excerpt, the alarm circuit 72 is **replaced** with sensors and associated circuitry designed to monitor both speed and direction of wheel rotation and this information is forwarded to the processor to control **steering and/or braking**. In this alternative embodiment disclosed by Hutchisson, the alarm function is **eliminated** because it is **replaced** by the sensors and associated circuitry designed to monitor both speed and direction of wheel rotation. Hutchisson is clear that in this alternate embodiment, the processor is only used to control **steering and/or braking**, and does not provide an alarm function.

Claims 1 and 11 claim that the electronic control module of the braking system interprets and uses the signals from the sensors to perform a back-up warning function. Hutchisson clearly does not contemplate an alarm function in this alternate embodiment. Any interpretation of Hutchisson in this regard can only be done with hindsight after reading Applicant's disclosure of its invention.

The addition of Broome does not solve the deficiency in Hutchisson. Broome discloses a conventional braking system which can be used to perform an ABS function.

Therefore, Applicant submits that the combination of Hutchisson and Broome does not render obvious claims 1-15 and 33-44. Reconsideration and allowance of claims 1-15 and 33-44 is respectfully requested.

With further regard to claims 8, 10 and 44, Applicant again agrees with the Examiner that a J560 connector is an industry standard to connect electrical components. Applicant submits, however, that the J560 connector is in an entirely different part of the vehicle and in no way helps to make connection to the wheel end. It appears that the Examiner has found it

obvious to use a J560 connector as the voltage source instead of the hub-mounted power supply 70 of Hutchisson. Provided Applicant's understanding is correct, Applicant disagrees with the Examiner in this regard. Hutchisson clearly teaches the use of the hub-mounted power supply 70 because as discussed in the Background of Invention section of Hutchisson, "Attaching an alarm to a vehicle so that it is connected to the electrical system further adds to the complexities of installing and maintaining the alarm." Hutchisson has provided the hub-mounted power supply 70 on the hub to do away with this complexity. Therefore, to provide the J560 connector as the power supply would be against the express teachings of Hutchisson. Reconsideration and withdrawal of this rejection is respectfully requested. The addition of Broome does not serve to render obvious these claims.


A version of any amended claims, on separate pages from the amendment, marked up to show all the changes relative to the previous version of the claims (underlining or bracketing) is also provided herewith in conformance with 37 C.F.R. 1.121(c)(1)(ii).

A clean version (no underlining and bracketing) of the entire set of pending claims, on separate pages from the amendment, is also provided herewith as detailed in 37 C.F.R. 1.121(c)(3).

In view of the above Amendments and Remarks, Applicant respectfully submits that the claims of the application are allowable over the rejections of the Examiner. Should the Examiner have any questions regarding this Amendment, the Examiner is invited to contact one of the undersigned attorneys at (312) 704-1890.

Respectfully submitted,

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**MARKED UP VERSION OF AMENDED CLAIMS IN  
CONFORMANCE WITH 37 C.F.R. 1.121(c)(1)(ii)**

1. (Twice Amended) A braking and back-up warning system for a vehicle having at least one wheel, said system comprising:

- a brake mechanism;
- a pneumatic control module connected to said brake mechanism;
- electronic structure configured to perform a back-up warning function;
- an electronic control module connected to said pneumatic control module and to said electronic structure; and

- a wheel sensing arrangement connected to said electronic control module by wiring, said wheel sensing arrangement configured to sense movement of the wheel of the vehicle and configured to communicate information relating to that which is sensed by said wheel sensing arrangement to said electronic control module, said electronic control module configured to operate said electronic structure based on information which is received from said wheel sensing arrangement relating to a direction of the wheel which is sensed by said wheel sensing arrangement.

11. (Thrice Amended) A braking and back-up warning system for a vehicle having at least one wheel, said system comprising:

- a brake mechanism;
- a pneumatic control module connected to said brake mechanism;
- at least one of structure for sounding an audible alarm and for lighting a lamp;
- an electronic control module connected to said pneumatic control module and to said at least one of structure for sounding an audible alarm and for lighting said lamp;
- a voltage source connected to said electronic control module; and
- a circuit which includes at least one sensor configured to sense movement of the wheel, said circuit configured to provide at least one signal to said electronic control module relating to the speed of the wheel which is sensed by said circuit and provide at least one signal to said electronic control module relating to the direction of the wheel which is sensed by said circuit, said circuit and said electronic control module connected together by wiring, said electronic control module configured to selectively connect said voltage source to at least one of said structure for sounding an audible alarm and for lighting said lamp, depending on

the at least one signal which is received from said circuit relating to the direction of the wheel which is sensed by said circuit.